1.5 Segments and Their Measures

Goal Measure segments. Add segment lengths.

VOCABULARY

Coordinate

Distance

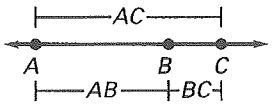
Length

Between

Congruent segments

POSTULATE 5: SEGMENT ADDITION POSTULATE

Words and Symbols



If B is between A and C, then $AC =$ ____ + ____.

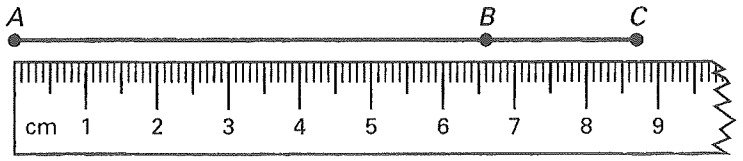
If $AC =$ ____ + ____, then B is between A and C.

Follow-Up

What is the relationship between the two parts of Postulate 5?

Example 1 ***Find the Distance Between Two Points***

Measure the lengths of $\overline{AC}$ and $\overline{BC}$ to the nearest millimeter.



Solution

Point *A* lines up with 0. Point *C* lines up with ___.

$AC = |\_\_\_ - 0| = \_\_\_$ mm

Point *B* lines up with ___. Point *C* lines up with ___.

$BC = |\_\_\_ - \_\_\_| = \_\_\_$ mm

Checkpoint **Measure the length of the segment to the nearest $\frac{1}{8}$ inch.**

1. 

2. 

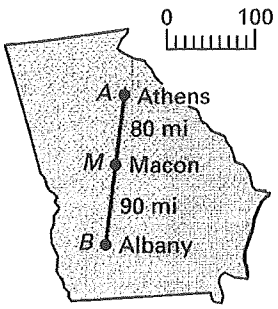
Measure the length of the segment to the nearest millimeter.

3. 

4. 

Example 2 *Find Distances on a Map*

Use the map to find the distance from Athens to Albany.



Solution

Because the three cities lie on a line, you can use the Segment Addition Postulate.

$AM =$ ____ miles $\qquad MB =$ ____ miles

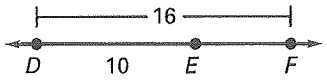
$AB = AM + MB =$ ____ + ____

$=$ ____ miles

Answer The distance from Athens to Albany is _____.

Example 3 *Find a Distance by Subtracting*

Use the diagram to find *EF*.



Solution

$DF =$ ____ + ____ **Use the Segment Addition Postulate.**

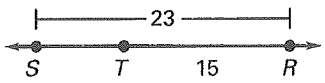
____ = ____ + ____ **Substitute values for *DF* and *DE*.**

____ = *EF* **Solve for *EF*.**

Checkpoint **Find the unmarked length.**

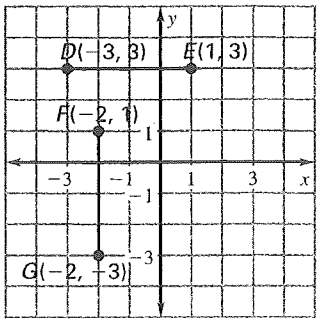
5.

6.



Example 4 ***Decide Whether Segments are Congruent***

Are the segments shown in the coordinate plane congruent?



Solution

For a horizontal segment, subtract the *x*-coordinates.

$DE = |\_\_ - \_\_\_\_| = |\_\_| = \_\_$

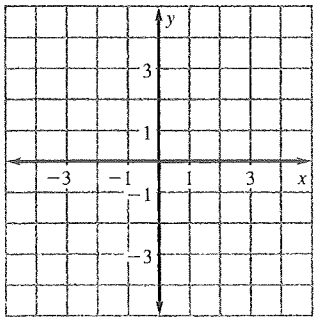
For a vertical segment, subtract the *y*-coordinates.

$FG = |\_\_\_\_ - \_\_| = |\_\_\_\_| = \_\_$

Answer DE ___ FG, so $\overline{DE}$ ___ $\overline{FG}$.

Checkpoint **Plot the points in a coordinate plane. Then decide whether $\overline{AB}$ and $\overline{CD}$ are congruent.**

7. $A(-2, 3)$, $B(3, 3)$, $C(-3, 4)$, $D(3, -1)$



8. $A(0, 5)$, $B(0, -1)$, $C(4, 0)$, $D(-1, 0)$